

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application. Please cancel claims 1-12 and 19-28, without prejudice or disclaimer, amend claim 13 and 15-18, and add new claims 37-48, as follows:

1-12. (Canceled).

13. (Amended) [The apparatus of claim 1, wherein the biasing mechanism comprises] An apparatus for transporting sample well trays with respect to a heating device, comprising:

a sample well tray holder comprising a plate in which a sample well tray may be positioned, said sample well tray holder configured to rotate about a first rotational axis;

a rotational actuator configured to rotate the sample well tray holder about the first rotational axis; and

a biasing mechanism comprising a spring member configured to urge the sample well tray holder in a generally upward direction along the first rotational axis.

14. (Original) The apparatus of claim 13, wherein the rotational actuator further comprises an output shaft that is rotatably fixed relative to the sample well tray holder, the spring member comprising a helical spring positioned around the first rotational axis and the output shaft.

15. (Currently Amended) The apparatus of claim 13, wherein the plate of the sample well tray holder includes a recess for positioning the sample well tray therein ~~7~~

~~wherein the biasing mechanism comprises a helical spring positioned around the first rotational axis and surrounding a portion of the spline bushing.~~

16. (Currently Amended) The apparatus of claim 13, further comprising a heating device with an opening for a sample well tray to be placed therein ~~1, further comprising a robot configured to grasp a sample well tray and transport the sample well tray to the sample well tray holder.~~

17. (Currently Amended) The apparatus of claim 16, wherein the heating device comprises a thermal cycling device ~~1, further comprising a heating device with an opening for the sample well tray to be placed therein.~~

18. (Currently Amended) The apparatus of claim 16, wherein the heating device includes a sample block ~~1, further comprising a heating device for conducting thermal cycling.~~

19-28. (Canceled).

29. (Original) A system for manipulating sample well trays, comprising:
a robot configured to transport a sample well tray to a first location;
a loading mechanism configured to take a sample well tray from the first location, place the sample well tray into a heating device at a second location and then later remove the sample well tray from the heating device and return the sample well tray to

the first location, the loading mechanism comprising a sample well tray holder in which a sample well tray may be positioned therein, a rotational actuator configured to rotate the sample well tray holder, and a biasing member configured to urge the sample well tray and sample well tray holder in a direction away from a sample block; and
a heating device having an opening for receiving the sample well tray therein.

30. (Original) The system of claim 29, wherein the heating device is a heater and the rotational actuator comprises a motor for rotating a shaft and a spline bushing positioned in a rotationally fixed manner on the shaft.

31. (Original) A method of manipulating sample well trays, comprising:
placing a sample well tray into a sample well tray holder of a first robot mechanism located at a first position;

rotating the sample well tray holder of the first robot mechanism about a rotational axis in a first rotational direction to insert the sample well tray holder into a heating device at a second position;

lowering the sample well tray holder in a direction toward a sample block of the heating device so that the sample well tray engages the sample block;

disengaging the sample well tray from the sample block so that the sample well tray does not directly contact the sample block;

lifting the sample well tray holder and sample well tray from the heating device by a biasing mechanism so that the sample well tray is capable of rotation away from the sample block and heating device without interference; and

rotating the sample well tray holder of the first robot mechanism in a second rotational direction toward the first position to remove the sample well tray holder from the heating device.

32. (Original) The method of claim 31, wherein the lowering of the sample well tray holder comprises engaging the sample well tray with a cover of the heating device in order to lower the sample well tray holder.

33. (Original) The method of claim 31, further comprising, prior to placing the sample well tray in a sample well tray holder, the step of picking up a sample well tray with a second robot mechanism, and rotating the sample well tray to place the sample well tray in the first position.

34. (Original) The method of claim 31, wherein the biasing mechanism that lifts the sample well tray holder comprises a helical spring that urges the sample well tray away from the sample block.

35. (Original) The method of claim 31, wherein the step of disengaging the sample well tray from the sample block includes providing an upward force on the sample well tray holder by an urging mechanism positioned between the sample well tray holder and the sample block.

36. (Original) The method of claim 35, wherein the urging mechanism comprises at least one spring device.

37. (New) The system of claim 29, wherein the heating device comprises a thermal cycling device.

38. (New) An apparatus for transporting sample well trays with respect to a thermal cycling device, comprising:

a sample well tray holder comprising a plate configured to receive a sample well tray, said sample well tray holder configured to rotate about a first rotational axis;

a rotational actuator configured to rotate the sample well tray holder about the first rotational axis to position the sample well tray over a sample block of the thermal cycling device; and

a biasing mechanism configured to urge the sample well tray holder in a generally upward direction along the first rotational axis.

39. (New) The apparatus of claim 38, wherein the rotational actuator is configured to cause the sample well tray holder to rotate from a first position to a second position in which the sample well tray is aligned with the sample block of the thermal cycling device.

40. (New) The apparatus of claim 38, wherein the biasing mechanism comprises a spring member.

41. (New) The apparatus of claim 40, wherein the rotational actuator further comprises an output shaft that is rotatably fixed relative to the sample well tray holder, the spring member comprising a helical spring positioned around the first rotational axis and the output shaft.

42. (New) The apparatus of claim 38, wherein the plate of the sample well tray holder includes a recess for positioning the sample well tray therein.

43. (New) The apparatus of claim 38, further comprising an opening in the thermal cycling device for the sample well tray to be placed therein.

44. (New) The apparatus of claim 38, wherein the rotational actuator comprises a motor.

45. (New) The apparatus of claim 38, further comprising a robot configured to grasp a sample well tray and transport the sample well tray to the sample well tray holder.

46. (New) A system for manipulating and thermal cycling a sample well tray, comprising:

a thermal cycling device having a sample block with a plurality of openings for receiving the sample well tray; and

a sample well tray handling apparatus configured to take the sample well tray from a first location, place the sample well tray into the thermal cycling device at a second location and then later remove the sample well tray from the thermal cycling device and return the sample well tray to the first location, the sample well tray handling apparatus comprising a sample well tray holder configured to receive the sample well tray therein, a rotational actuator configured to rotate the sample well tray holder, and an extension arm extending from the rotational actuator and being connected to the sample well tray holder.

47. The system of claim 46, the sample well tray handling apparatus further comprising a biasing member configured to urge the sample well tray and sample well tray holder in a direction away from the sample block of the thermal cycling device.

48. The system of claim 46, further comprising a robot with a robotic arm configured to transport the sample well tray to the first location.